

Appl. No. 10/692,174
Amtd. dated September 1, 2005
Reply to Office Action of July 1, 2005

REMARKS/ARGUMENTS

Claims 1-25, 30, 39, 40, 44-47, and 49-72 are canceled, and claims 86-99 are newly added. Claims 26-29, 31-38, 41-43, 48, and 73-99 are now pending in the application. Applicants respectfully request entry of this amendment and reexamination and reconsideration of the application.

Claims 26-29, 31-38, 41-43, 48, 54, 57-60, and 66-85 were rejected under 35 USC § 103(a) as obvious in view of US Patent No. 5,810,609 to Faraci et al. ("Faraci") in combination with one or more of US Patent No. 5,653,598 to Grabbe ("Grabbe"), US Patent No. 5,180,482 to Abys et al. ("Abys"), US Patent No. 5,137,456 to Desai et al. ("Desai"), US Patent No. 3,648,355 to Shiba et al. ("Shiba"), and US Patent No. 5,632,631 to Fjelstad ("Fjelstad"). Applicants respectfully traverse these rejections.

The "test apparatus" described in claim 26 and the "test apparatus" described in 42 both include probes that are made of at least palladium. Recognizing that Faraci does not teach or suggest making any part of the contacts 190, 200 of palladium, the Office Action proposes modifying Faraci's contacts 190, 200 to include palladium in view of Grabbe, Abys, Desai, Shiba, and Fjelstad, each of which mentions use of palladium.

A person skilled in the field would not, however, have modified Faraci's contacts 190, 200 to include palladium because Faraci teaches against such a modification. Moreover, such a modification would render Faraci unfit for its intended purpose.

As described in Faraci, if the microelectronic device 265 passes testing, the bump leads 260 of the microelectronic device 265 are "*metallurgically bonded* to the contacts [190, 200] after the testing step." (Faraci col. 10, lines 28-29 (emphasis added).) As further described in Faraci, "[t]his can be done by *heating* the assembly so as to actuate the bonding material on or comprising the bump leads *and thereby form metallurgical bonds* between the bump leads [260] and contacts [190, 200]" without the need to remove the microelectronic device. (Faraci col. 10, lines 29-32 (emphasis added).) The heat needed to actuate a metallurgical bond in a hard, wear resistant material like palladium could damage Faraci's microelectronic device 265, which is contrary to Faraci's teachings and purpose. (See, e.g., Faraci col. 10, lines 28-43.) Therefore, a person skilled in the field would not modify Faraci to make contacts 190, 200 of palladium. Consequently, the rejection of independent claims 26 and 42 should be withdrawn.

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Claims 27-29, 31-38, 41, 43, 48, and 73-99 depend from one of independent claims 26 or 42 and are therefore patentable over the prior art of record, whether taken individually or in combination. Moreover, claims 27-29, 31-38, 41, 43, 48, and 73-99 recite additional features that are not taught or suggested by the prior art of record.

For example, claims 27 and 43 require that the probes comprise palladium cobalt. Only Abys and Shiba even mention the use of palladium cobalt. Neither Abys nor Shiba, however, teaches or suggests using palladium cobalt in contacts designed for microelectronic circuits like Faraci. Abys' teachings are limited to relatively large electrical connectors, like relay contacts and switches. (Abys col. 1, lines 19-21.) In fact, the palladium cobalt disclosed in Abys is shaped using stamping operations. (Abys col. 2, lines 15-18.) Without question, stamping operations cannot be used in making Faraci's micro contacts 190, 200, which are designed for use with a microelectronic device 265 and must therefore be made using delicate lithographic techniques like those used to form integrated circuits on semiconductor dies. (See Faraci Figures 6A-6E.) Abys' does not explain how or even hint that palladium cobalt could or should be used with microelectronic contacts (like Faraci's) fabricated using delicate semiconductor fabrication techniques. Shiba's teachings regarding electric contact material 10, which is formed by heating and pressing together layers 1, 2, and 3 (Shiba col. 2, lines 1-75), are similarly not applicable to or usable with Faraci's microelectronic contacts 190, 200 and would not lead a person of skill in the field to make Faraci's contacts 190, 200 of palladium cobalt. Thus, it would not have been obvious to combine Abys or Shiba with Faraci, and the rejection of claims 27 and 43 should accordingly be withdrawn.

As another example, new claims 86, 87, 93, and 94 state that the tips of the probes "are disposed to contact terminals of said electronic device having a pitch of less than five mils spacing between adjacent ones of said terminals." None of the prior art of record teaches or suggests probes that are configured to contact terminals with such a tight pitch. Nor is such a pitch a matter of mere design choice. Rather, such a pitch makes the apparatus of claims 86, 87, 93, and 94 suitable for testing small electronic devices, such as unpackaged semiconductor dies. At least because Faraci requires the use of a plurality of contact structures 190, 200 to contact one contact 260 of microelectronic device 265, Faraci's apparatus is not capable of contacting an electronic device with terminals at such a tight pitch. New claims 86, 87, 93, and 94 are thus patentable over Faraci and the other prior art of record.

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New claims 89 and 96 state that the tips of the probes are disposed to contact a plurality of terminals of *a plurality of semiconductor dies*, and new claim 90 and 97 state that the "dies compose an unsingulated semiconductor wafer." In contrast, Faraci is design specifically to contact only one microelectronic device, and Faraci is not capable of contacting dies of an unsingulated semiconductor wafer. New claims 89, 90, 96, and 97 are thus patentable over Faraci and the other prior art of record.

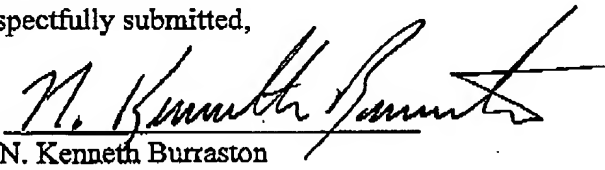
New claims 91 and 98 state that the terminals contacted by the probes are bond pads of a semiconductor die, and new claims 92 and 99 state that the terminal is "flat." In contrast, Faraci's contacts 190, 200 are specially designed for spherically shaped ball grid array contacts 260. Faraci's contacts 190, 200 are not capable of making electrical connections with bond pads of a semiconductor die or flat terminals. New claims 91, 92, 98, and 99 are therefore patentable over Faraci and the other prior art of record.

In view of the foregoing, Applicants submit that all of the claims are allowable and the application is in condition for allowance. If the Examiner believes that a discussion with Applicants' attorney would be helpful, the Examiner is invited to contact the undersigned at (801) 323-5934.

Respectfully submitted,

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